

THE ZOOLOGIST

No. 840.—June. 1911.

THE SOUTH KENSINGTON SITE.*

(A DANGER TO THE FUTURE GROWTH AND EFFICIENCY OF THE
NATIONAL NATURAL HISTORY MUSEUM.)

WE learn that a Memorial signed by Sir Henry Roscoe and others referring to the site on which it is proposed to place an extension of the buildings of the Science Museum was recently presented to the Cabinet by Mr. Runciman, President of the Board of Education. We have heard with grave concern that the Government have come to a conclusion which apparently agrees with the views formulated by the Memorialists. In the belief that the imposing display of opinion indicated by the signatures of many leading men of Science may not have been without effect upon the deliberations of the Government, we venture respectfully to call your attention to the fact that a number of others who are interested in the progress of Science in this country take a view which is widely different from that which has been represented in the above-mentioned Memorial.

In taking this step we wish to make it clear that we are actuated by no feelings of hostility to the Science Museum. We should, on the contrary, welcome the fulfilment of the wish expressed by so many of our colleagues and friends that a worthy home may be found for the Science Museum. We can-

* This protest, signed by the leading naturalists in the country, and due to the initiation and energy of Dr. A. E. Shipley, F.R.S., Master of Christ's College and Reader in Zoology in the University of Cambridge, has been addressed to the Right Hon. H. H. Asquith, M.P., Prime Minister.

not, however, avoid the suspicion that some of those who have signed Sir Henry Roscoe's Memorial have done so in ignorance of the irreparable nature of the injury which would be done to the Natural History Museum by the curtailment of its present site. This conclusion appears to be supported by the words of the Memorialists, who say :

"We, the undersigned, interested in the practice and progress of British Science and Industry, beg, therefore, to express our emphatic opinion that, whilst nothing should be done to interfere with the development of the Natural History Museum, any action which prevents the erection of a Science Museum on an adequate scale on the proposed site would be a national disaster, and we cannot but believe that the two competing claims can be reconciled without the sacrifice of essentials on either side."

It becomes incumbent on us to show, therefore, that the proposed allocation of the site would interfere with the development of the Natural History Museum to such an extent as to affect vitally the continued efficiency of that Museum, and to render nugatory the provision which had been made for its normal growth in the future.

The Natural History Museum is about thirty years old, but during the short time in which it has been in existence the collections have increased to an extent which can hardly have been anticipated by those who were responsible for drawing out the original plans. It cannot be too strongly emphasized that the growth which must continue to go on, if the Museum is to hold its position among the great Museums of the world, is very far from having reached its limit. The number of species of animals and plants, recent and extinct, which are not at present represented in the Museum is enormous. The importance of the Biological Sciences in matters which affect the practical concerns of mankind is becoming increasingly obvious. Not only has the study of these Sciences, in their relation to the theory of Evolution, profoundly affected every department of Human thought, but it has also been proved to have the most important bearing on Economic questions. We may merely allude, in this connexion, to the discovery of the part played



by blood-sucking Insects in the dissemination of Sleeping Sickness, Malaria, Plague, Yellow Fever, and other diseases which affect Man and Domestic animals, and to the immense practical importance of an accurate knowledge of the Insect and other pests which attack cultivated crops. In some of the studies connected with these Insects the Museum has taken an important share. In order that it may continue to do so it is essential that room should be left for expansion of the collection of Insects ; and large additions to the Insect-Room are urgently required even now.

Throughout the Museum the need of additional accommodation is already acutely felt. The public Galleries are overcrowded, the space available for the study-collections which are indispensable for comparison when the opinion of the Museum is asked on any question is quite inadequate, and in some parts of the Institution it is already impossible to find proper accommodation for the members of the permanent staff and for students who come to consult the collections. It is impossible to foresee the future needs of Palæontology, but the Museum would even now have great difficulty in finding room for the reception of any considerable collection of the more gigantic species, such as some of the extinct Reptiles, new forms of which are being discovered by expeditions at present in the field.

We think that the full effect of the proposal to remove the Spirit-Building from its present position can hardly have been apparent to some of those who signed Sir Henry Roscoe's Memorial. We pass over the waste of public money which is involved in the destruction of a building which, with its fittings, has cost £30,000. The alienation of the strip of land, to the North of the main Museum, which it is proposed to hand over to the Science Museum, would leave an area to the North of the former building which would be so small as hardly to provide sufficient accommodation for any extension of the numerous outbuildings which are essential for the work of the Museum. But the most fatal objection to the present proposal is that, by placing the Spirit-Building anywhere between the main Museum and the public roads, space would be occupied which is of vital importance to reserve for the future growth of the main Museum itself.

The experience of the last thirty years proves beyond the shadow of a doubt, in our opinion, that the whole of the unoccupied part of the site which has hitherto been reserved for the Natural History Museum is barely sufficient for the extensions which will be required in a future, which is by no means remote.

We, the undersigned, beg therefore to express our emphatic opinion that the maintenance in its integrity of the site which was secured to the Natural History Museum by the delimitation of its Northern boundary by the Treasury and the Office of Works in 1899 is of vital importance to the future efficiency of that Museum ; and we beg most respectfully that you will cause such steps to be taken as will secure a consideration of our views before the question is finally decided.

THE DEVELOPMENT OF THE SNIPE.

BY F. J. STUBBS.

THE informed ornithologist rarely finds himself pleased with a mounted Snipe, or with the picture of one. Even such masters of ornithological art as Wolf or Keulemans have failed with the Jack-Snipe, and one searches in vain through the ornate literature of birds for a faithful portrait. It is now many years since naturalists first began to notice the orderly arrangement of the roots of a bird's feathers, but apparently few appreciate the value of the order prevailing in the disposition of their distal ends. Several modern artists since Wolf have seen their models intelligently, yet the work of the average taxidermist is still a disappointment, although better results might have been expected from the general example set by such men as Pickhardt and Ward.

This is not the place to demonstrate the errors appearing in stuffed birds, but one or two examples will be noted as having a bearing on my further remarks. For instance, the spots on the breast of the Common Flycatcher are, in life, arranged to form distinct streaks. This is so with many other birds, but after passing through the hands of the stuffer the pattern is an inextricable tangle. The streaks have vanished, and the outward pattern or *feather mosaic* of the bird is distorted beyond recognition. Now, I hasten to add that this result is not invariably the fault of the taxidermist, for rearrangement of the feathers is always very difficult and is often impossible.

In the living, healthy bird the feathers are as definitely arranged as are the scales on a reptile. In some of the smaller perching birds this is not always evident, particularly on the back; but in such as the Grouse or the Pheasant, and in hundreds of other birds, the markings of the feather-tips follow in regular succession to form a special design that is unquestionably of importance to the wearer. Each feather stands in a settled relation to its neighbours, and the general pattern depends on the proper arrangement of these elements of colour. Spots, as I remark, collect in ranks to form stripes, and such marks as the eyes on a Peacock's train, instead of being scat-

tered without law (as many artists have depicted them), are marshalled in geometrically accurate, intersecting arcs of circles.

In portraits of the Jack-Snipe the feathers are not properly drawn, nor have they been accurately described in any work I have yet consulted. The long golden scapulars are said to be "yellow on the outer webs." This is only partially true, for the anterior feathers are alternately yellow on the outer and on the inner webs. In the living bird, except on rare occasions, these important feathers are so arranged that the yellow parts exactly overlap and produce two brilliant golden streaks down the sides of the back. The edges are cleanly defined, and when we tamper with the arrangement, upsetting the order of the colours (*i. e.* causing the dark web to fall below the yellow web of the preceding feather), the loss in brilliancy becomes at once evident. The brightness is attained by each yellow web being backed by a second yellow web with the barbs crossing at right angles, and this arrangement is of the utmost importance to the bird.

When a Jack-Snipe is flushed at short range, and flies down wind, the scapulars may sometimes be seen fluttering like tiny pennons; yet when the same bird is detected a few seconds later lying prone and motionless, the feathers are clearly arranged with instinctive care. In a drawing these feathers are rarely, if ever, properly figured; yet I have seen one excellent photograph (in Mr. R. Kearton's 'Wild Nature's Ways,' p. 266) that gives a refreshingly accurate portrait of a Jack-Snipe—one of the rare instances in which the camera rises superior both to the man of science and to the trained draughtsman. It is seldom, indeed, that this bird leaves the taxidermist's hands anything else except a bedraggled caricature. In a freshly killed bird, by a little patience, it is possible to replace the feathers in their proper order, but the task is far easier with a "green" skin, for the slightest scratching with the finger-nail along the inside, following the pteryllæ, is sufficient to throw the feathers into their natural ranks. With care this order can be preserved in the mounted bird.

In spite of its wide distribution, the Jack-Snipe is not a well-known bird to the field naturalist who is not also a sportsman. It is rarely observed except on the wing. Even the gunner seldom sees the bird until it is flushed by his dog or by

his own footsteps. It has been written (vaguely and without details) that the Jack-Snipe skulks in the dense vegetation like a Rail, and runs like that bird through the miniature jungle of the marsh. On the contrary, the bird is rarely encountered except in a clear space, small though this may sometimes be. Frequently I have seen them on perfectly bare mud, or on beds of *Sphagnum* away from more conspicuous vegetation.

In such a setting the Jack-Snipe forms the most perfect example of elaborate protective coloration with which I am acquainted. The fact that I have often seen them does not directly affect the question, for I have succeeded not by looking for a bird, but by searching for *two curved blades of faded grass* of a colour rather more brilliant than that of any plant native to the locality where most of my observations were made. Perhaps I might offer a quotation from one of my note-books (October 8th, 1901) describing my first appreciation—I had been before acquainted with the matter in a careless degree—of the coloration of the bird:—"The dog had been twice round the pond [a miniature spongy marsh perhaps thirty yards square] . . . when two yellow streaks caught my eye, and I saw a Jack, prone, with head and bill stretched straight out in front; the grey feathers of the bird almost invisible, and the bright yellow feathers on the back looking marvellously like two withered blades of sedge. . . . I had to make a few seconds' examination at a distance of four or five feet before I could convince myself that I had not made some mistake. For about five minutes I walked around it, looking at it from different points of view, and the bird never moved in the least."

Since that date I have observed many such cases, and have experimented with the birds, both living and dead, at home and in the field. Sometimes it has happened that the Snipe has been surprised on a patch of green turf, or some other in-harmonious background, and (not caring to fly) has run to squat down on the mud near a patch of herbage in the adjacent pond. The prone position is worth noticing. The feet and legs are entirely hidden, the tail is depressed until the tip just touches the ground, and the bill is laid flat. Differing from my first note on this point, the neck is usually bent until the head is close in to the shoulders. In transverse section the bird

would be not circular but triangular: a crouching bird (of any species) habitually spreads out the flank feathers on each side, with the effect—whether intentional or not, I cannot say—of destroying the tell-tale shadows. The importance of this action can only be appreciated by those prepared to make actual experiments.

The streaks on the head of the bird are vaguely in line with the dorsal stripes, which are very conspicuous, and curved and tapered like the faded leaves of the surrounding *Carex curta* or similar marsh plant. The remainder of the bird has disappeared; not actually hidden behind any material screen, but obscured by the glaring rivalry of the yellow plumes. There is also a further aid to obliteration. In nine cases out of ten the bird is crouching near a pool of water. This, of course, reflects the light of the sky, and is almost or quite white against the surrounding earth. While experimenting with dead birds, playing a sort of hide-and-seek, I found that the simple act of placing the Snipe at the edge of a tiny pool, or even close to my handkerchief dropped (apparently casually) on the ground, served to mislead my companion to a most gratifying extent.

The explanation is, of course, that the gaze is attracted by the patch of white and (if I may be allowed the useful exaggeration) blinded by its glare to such an extent that adjacent inconspicuous objects pass unnoticed, and the eye roves on to another part of the field. In a similar manner do we explain the value and meaning of the dorsal stripes. The enemy (whatever form this may take) is looking for birds, and not for a couple of dead leaves of sedge, and the more noticeable these leaves can be, the more will they monopolize the gaze of eyes that would otherwise hardly fail to detect the delicate differences between the rest of the bird and the bare ground on which it crouches. The metallic purples and greens of the mantle, and the elaborately designed colours of the rest of the plumage, all take definite parts in the general scheme, either by matching the colours of the damp ground, by simulating the fragments of dead stems and grasses, or (by the action of the law of simultaneous contrast) enhancing the brilliancy of the stripes on the back.

Excellent as the livery is, it would be almost useless without two important ancillary features. The Jack-Snipe has a perfect (instinctive) confidence in its invisibility that places it in a

position apart from other British birds. Although one of the shy and wary race of waders, it will on occasion wait until actually trodden on. I once saw a pointer place his paw upon a Jack-Snipe, holding the bird until I picked it up, and I can remember at least one case of a bird being caught in a cloth cap.

Such occurrences are unusual, for, although lying apparently paralyzed, the bird is really perfectly alert, and when capture seems imminent it springs—a living Jack-in-the-box—far into the air, and is well on the wing before the startled intruder can gather his wits. A winged Grouse or Plover, if unable to hide, will seek safety in running. The wounded Snipe progresses in a series of huge hops, a gait that is the response to the instinct telling that the first move out of danger is to spring into the air.

Many sportsmen believe that the Snipe uses its bill as a third leg in leaping from the ground, and that occasionally it will strike downwards with such force on soft ground that the bill becomes embedded, and cannot be withdrawn quickly enough to avoid capture. I once had a Common Snipe brought to me by a man who had caught it in this manner. He was, however, mistaken, as I shall explain later. Neither the Common Snipe nor the Jack use the bill in this way. I have frequently watched them rise, sometimes from a distance of a few inches (in observing both wild and captive birds), and always found the bill to be kept parallel with the ground. The birds spring entirely from the legs, which are in both species extraordinarily large and muscular.

In the Jack-Snipe the muscles of the toes are particularly powerful, and the leg of the bird is bigger than that of a Knot, which far exceeds it in size and weight (two and a quarter ounces against five ounces). The muscles of the thigh are also unusually large, but direct observation suggests that the toes are chiefly used in the work of lifting the bird from the ground.

The necessity for this powerful apparatus is obvious, for protective colours on a bare marsh would be of little use in the event of their owner being unable to get a good start when movement became imperative. Perhaps this suggests a use for the long inner secondaries, which keep the primaries dry and prepared for flight, although the rest of the plumage may be

damp from brushing against wet herbage. I have noted this feature in many other birds addicted to running or creeping about amongst plants that may often be rain-soaked.

The true home of the Jack-Snipe is in permanent marsh with preferably a peaty humus. Thousands of small ponds throughout the country supply the necessary conditions, and in these the bird lives unsuspected by most men, and free from enemies or rival species—with one striking exception, which I shall discuss later. So far as a barrier to human beings is concerned, five feet of peaty mud of unknown depth is as good as fifty yards when no reason for crossing it is evident. The bird has little to fear from Stoat or Kestrel, or even, after considering the local conditions, from the Heron. Such creatures as Harriers and Bitterns, once abundant in Europe, were perhaps the factors stimulating the Jack-Snipe* to adopt its present livery and habits; and to-day the bird is left with hardly any enemy except the combination of a man with a gun and a dog. As a consequence it is firmly established as a common British bird, and one that can only be attacked by the destruction of its haunts.

It is a common joke that the novice can return again and again to the same corner of marsh to flush, shoot at, and miss the same Jack-Snipe. Yet this still holds good if the bird be killed each morning! Some tiny pond may never hold more than one, or perhaps two birds. If one be flushed by a dog and shot, the place will hold another the next day, if not the same day at a later hour. This process can be repeated far into the winter: I am speaking now in general terms, and of districts where the conditions are suited to the peculiar requirements of the bird. Thus it will be seen that it is the race and not the individual that is constant to the favourite habitat. The Jack-Snipe is as faithful—if this be the proper term—to its marsh as the Sand-Martin is to its particular river-bank, or the Bittern to its reed-bed. Like them, it is fitted to these particular surroundings, and is uncomfortable and unsafe anywhere else.

I recollect the case of a man actually killing from a single small pond a Snipe a day for eighteen consecutive days. I forget how many of these were Jacks, but I see no reason to doubt that the same process could be gone through by one who

* As a species, acting upon it by eliminating the least protected individuals.

devoted himself to procuring the smaller bird, from a spot that was suited to the species. The ponds I write about are really fragments of true marsh-land, with a distinct florula—*Sphagnum* spp., *Marchantia polymorpha*, *Eriophorum angustifolium*, *Carex curta*, *C. levigata*, *Comarum palustre*, and plants of a similar character. At one time many parts of England, now drained, were clothed with these peat-loving plants. To-day, when a "made" pond stands long enough, a deposit of peat forms an island in the middle, and in time it becomes covered with the plants I name above, and in winter forms a safe home for the Jack-Snipe. It appears to me that there are more birds than we have room for, and if we kill the individual occupying a desirable pond, the spot is at once occupied by the first-comer from what one may term the floating population. It is hardly necessary to add that the Jack-Snipe does not crowd in these localities; if this were so, my explanation would not hold good.

The sexes of the Jack-Snipe are alike at all seasons, and the antiquity of the livery is suggested by the nestling bird, in which the dorsal plumes are brilliant and well-defined, and the bill precociously lengthy. That the plumage has passed the plastic stage is proved by the rarity of variations. I have only been able to learn of two abnormal Jack-Snipes. Mr. Bond had a very dark (melanistic) specimen in his collection, and some years ago the 'Countryside' published a photograph of one with white feathers in the wings. As we all know, varieties amongst Common Snipe are remarkably frequent—more so, perhaps, than in any other British bird except the Ruff.

The Jack-Snipe rises superior to a frost hard enough to clear a district of all other marsh-birds, and I have known it to remain long after every drop of water had been bound up as ice; under these conditions they live well. The plumpness of a Jack in frosty weather is proverbial, while under the same conditions the Common Snipe may be reduced to a pitiful bunch of feathers. Many of the above details form part of the common knowledge of observers, but their application is important.

Every ornithologist knows that the Jack-Snipe is exclusively a winter visitor to this country; the many accounts of its nesting with us are not worth a moment's attention. Differing from

most winter *Limicolæ* (*Arenaria*, *Strepsilas*, *Limosa*, &c.), individuals are very rarely noticed in England during summer. The first records generally mention the middle or end of September. My earliest personal record is the remarkable date of Sept. 9th (1905), when I picked one up beneath the telegraph-wires in the Conway Valley; yet I have seen many in the third week of September, and have had odd ones brought to me in the second week of that month. The range of the Jack-Snipe is very great, but I have failed to discover what grounds Seeböhm had for stating (in his 'Distribution of the Charadriidæ') that the species originated in Ceylon. Little good can come of taking this fanciful speculation seriously, for in accepting it we must allow that, while the summer range has wandered far to the north, the winter range has radiated in all directions!

In England the Jack-Snipe is a silent bird. I have two records, both made in Yorkshire (by Atkinson and by Boyes), of cases in which a bird was heard to utter a thin bat-like note. Dubois ('Faun. Ill. Vert. Belg., Oiseaux,' ii. 233) describes it as quite a noisy creature in Belgium; but I am inclined to think that perhaps he is quoting some author who has written of the Jack-Snipe in other parts of Europe. In the far northern breeding grounds it is said to be a noisy bird, but we are not told whether its "hollow notes" are vocal or instrumental. A fine day in late winter will sometimes prompt the Common Snipe to flutter and "chip," if not to drum, but I have never known its sedate little neighbour to act so under the same emotions in England.

Linnaeus, when he prepared the Tenth Edition of his 'Systema Naturæ,' did not know the Jack-Snipe. Earlier writers in this country failed to separate it from the Common Snipe; Francis Willughby confessed that, until corrected by Mr. Lister, he believed it to be the "Cock Snipe," and this is still the opinion of ignorant sportsmen. Even to-day many students of birds hold the two species to belong to the same genus, but some writers, aware of the striking differences displayed in the sternum and the tail, have placed the birds apart, using the genus *Lymnocryptes* of Kaup for the smaller bird, and that of *Gallinago* for the other.

(To be continued.)

THE BIRDS OF THAT PORTION OF THE NORTH-EAST COAST BETWEEN TYNEMOUTH AND SEATON SLUICE, NORTHUMBERLAND.

By J. M. CHARLTON.

(Continued from p. 131.)

(PLATE IV.)

MISTLE-THRUSH (*Turdus viscivorus*).—A fairly common resident. A few pairs breed annually in Holywell and Whitley Denes. I have no records of any migratory movements.

SONG-THRUSH (*T. musicus*).—Numerous both as a resident and migrant. Large numbers of the latter go by, passing south in autumn and north in spring. Many frequently pass inland also in autumn from the north-east, and at the same time other birds are leaving the coast and *vice versa* in spring. These migratory movements occur so closely upon one another that it is only with the greatest care that they can be distinguished. I have seen during these migrations many hundreds of weary travellers hopping disconsolately about among the numbers of fishing cobbles lying on the top of the banks at George's Point, Cullercoats, and doubtless these boats form an adequate shelter for such as they when waylaid during stormy weather. Mr. W. G. Monk informs me that, while he was on the lighthouse on St. Mary's Island, in the autumn, during the prevalence of hazy weather, numbers of these birds, together with Black-birds and Starlings, frequently hovered around the lantern. Mr. H. S. Wallace, writing in the 'Newcastle Weekly Chronicle,' March, 1910, mentions a large stone on Seaton Links used by Thrushes as a means of breaking snail-shells. He identified the following species of snails from the shells cast around:—*Helix nemoralis*, *H. hortensis*, *H. hortensis minor*, *H. hortensis* var. *lilacina*, *H. arbustorum*. I have not come across many of these breaking stones in the district. The local name for this species is "Grey bird."

REDWING (*T. iliacus*).—A fairly common winter visitant, commonest during the time of arrival in autumn and departure in spring. As a rule they arrive at the beginning of October, but sometimes later.

FIELDFARE (*T. pilaris*).—A fairly common winter visitant, and more so than the last species. The times of its most frequent occurrence are the same as those of the Redwing. The average date of the first arrival is Oct. 2nd. The local name is "Feltie."

BLACKBIRD (*T. merula*).—A common resident and migrant. In April, 1910, a pair built a nest of string and clematis-stalks in an old aviary in our garden. A pied bird was shot at Seaton Delaval in about 1900, another at Whitley somewhat later, and one with white markings on the head at Holywell in 1909.

RING-OUZEL (*T. torquatus*).—This species is rare here, and the two specimens obtained were spring migrants which had just arrived and were halting on the coast before passing inland. An adult was shot at Cullercoats on May 1st, 1834, and is now in the Hancock Museum. Another bird of this species was shot at St. Mary's Island in April, 1904.

WHEATEAR (*Saxicola œnanthe*).—A regular resident during spring and summer, and more numerous in spring and autumn when numbers of migrants arrive and depart respectively. Breeds along the sea-banks at Whitley. Usual dates of first arrival—March 30th or April 1st; the earliest record I have is March 20th, which was in 1905. Young fully fledged are usually seen by June 22nd. I several times observed a male uttering its short and somewhat mixed song, hovering some six feet above the grass on George's Point, Cullercoats, during June, 1903, while his mate sat on her nest under the bank. Mr. Hodgson informs me that several years ago he found a nest of this species containing eggs in a hole in a stump in Briar Dene. There were two entrances which had been formed for a rope to pass through, and the bird retreated by the exit opposite to the approaching observer. Unfortunately, as is the same in many places, when he returned a day or so later, some urchins had harried the nest. The latest record of the departure of this species is October 2nd, in 1909. The local name is "Whiterump."

WHINCHAT (*Pratincola rubetra*).—Now only seen in spring

and autumn when on migration, but formerly it used to breed regularly on Whitley Links. A young bird in the first plumage, which was shot there on July 26th, 1877, is in the Museum.

STONECHAT (*P. rubicola*).—An uncommon spring and summer resident. A favourite haunt is on the furze along the sea-banks at Whitley, now fast disappearing. The first record I have is of one, now in the Museum, shot at Whitley in 1835. It seldom occurs in winter, and then only on migration.

REDSTART (*Ruticilla phœnicurus*).—It is only seen on migration, in spring and autumn, although formerly it probably bred in the district. The first record I know of is one shot at St. Mary's on Sept. 3rd, 1899, and which is in the Museum. The usual date of the first arrival is April 14th. The local name is "Nanny Redtail."

BLACK REDSTART (*R. titys*).—A rare winter visitant. A male, which is in the Hancock Museum, was shot at Cullercoats in 1856; and in March, 1857, a female was shot at the same place. These two are mentioned in J. Hancock's catalogue. I saw a male on Nov. 23rd, 1903, at the rifle range near St. Mary's Island; it had only just arrived and was very exhausted, allowing me to approach very close to it.

BLUE-THROATED WARBLER (*Cyanecula suecica*).—There are two records of the occurrence of this species in the district. The first I found among some notes of John Hancock's, written after the publication of his Catalogue. He writes as follows:—"A specimen of this interesting bird was shot at Cullercoats on Wed., 8th Oct., 1879. I saw the bird at a birdstuffer's in Percy Street a few days after it was shot. The specimen belongs to a Mr. Richardson." The birdstuffer would be R. Charlton, of Newcastle-on-Tyne. The second bird was taken on St. Mary's Island by Mr. J. Ewen, on Sept. 18th, 1883. It was stuffed by Mr. Bates, of Newcastle, and examined by J. Hancock, who considered it to be a female of the northern form in winter plumage, just having completed the moult. Mr. Ewen informs me that he watched it in his garden on the island for several hours before he shot it. This was the time of the large immigration of this species on the east coast. The first example was also of the northern or red-spotted form, which is usually the form obtained in Britain.

REDBREAST (*Erithacus rubecula*).—A common resident.

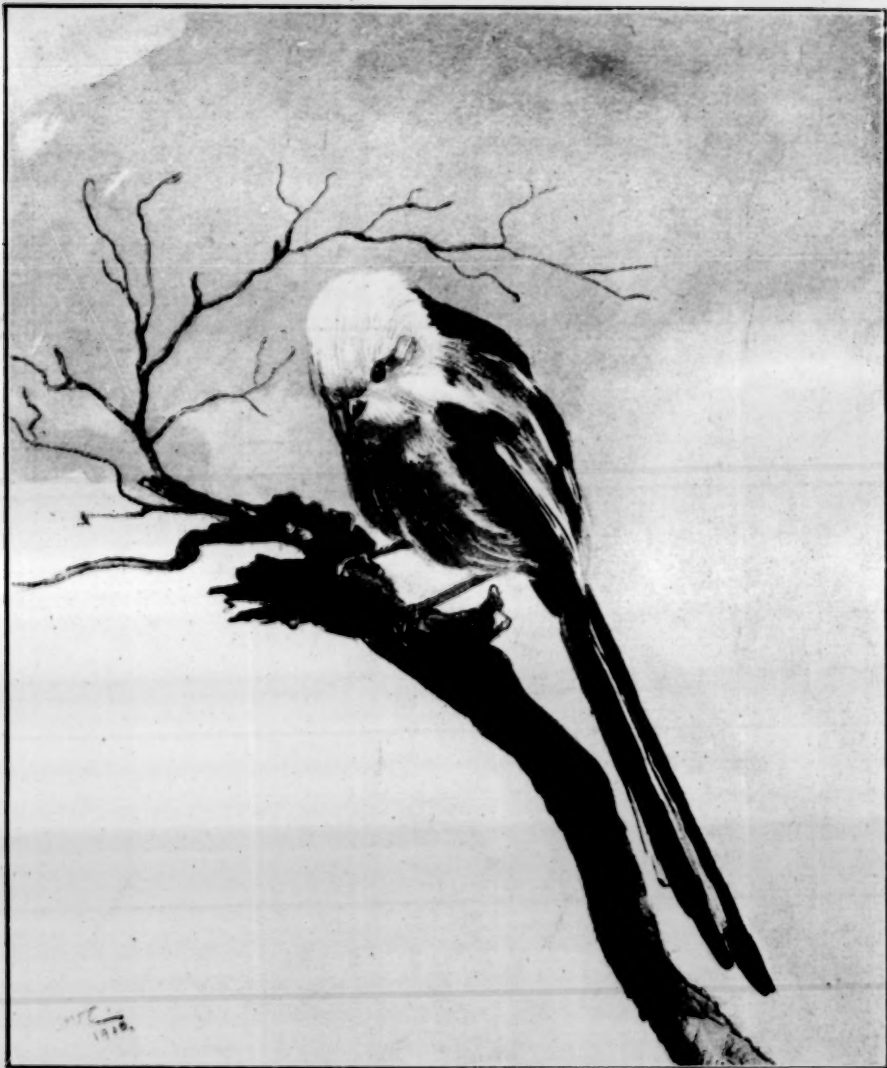
WHITETHROAT (*Sylvia cinerea*).—Rare as a spring and summer resident; more numerous on the coast at the time of its arrival in spring and departure in autumn, but never occurs in large numbers.

GOLDEN-CRESTED WREN (*Regulus cristatus*).—An autumn migrant; quantities arrive on the coast generally in October, and I have found them in the streets of Cullercoats so exhausted that I could easily catch them with my hands. J. Hancock mentions in his Catalogue that they may be seen every autumn as they arrive at St. Mary's Island in large numbers, and Mr. W. G. Monk tells me that he occasionally caught them during storms on the lighthouse there. The year 1906 was remarkable for a large influx of these birds.

YELLOW-BROWED WARBLER (*Phylloscopus superciliosus*).—The first specimen obtained in Britain was shot on the sea-banks opposite Bates' (St. Mary's) Island by John Hancock on Sept. 26th, 1838. In his Catalogue, Hancock says:—"It was catching insects on the tops of the taller herbage; and its actions were so like those of the Golden-crested Wren that I mistook it at first for one of that species. Its movements were very graceful as it flitted from plant to plant." This specimen, which is an adult male, is now in the Hancock Museum, and is figured by Hancock in his Catalogue. This specimen was supposed to be a Pallas's Willow-Warbler (*P. proregulus*) ["Dalmatian Regulus," Gould] until 1863, when Swinhoe pointed out the error, and Hancock rectified his identification ('Ibis,' 1867, p. 252) [H. Saunders, Man. pp. 61, 63].

CHIFFCHAFF (*P. rufus*).—Arrives in small numbers in spring. An adult male was shot by my brother, H. V. Charlton, while it was creeping about in a hedgerow behind Cullercoats on Dec. 20th, 1905. The weather at the time was very stormy, and it must have been on migration south from some sheltered spot in the south of Scotland, where it had remained to tempt fortune too long. This specimen is now in the Hancock Museum (Zool. 1906).

WILLOW-WREN (*P. trochilus*).—Numerous as a migrant, but only a few breed in the district, and those chiefly in Briar and Holywell Denes. The average date for its arrival is April 21st.



WHITE-HEADED LONG-TAILED TITMOUSE
(*Acredula caudata*).

SEDGE-WARBLER (*Acrocephalus phragmitis*).—Although this bird probably was, and is, a regular spring and autumn migrant, yet, owing to its arriving at night, as do most migrants, and quickly departing inland, I have no record of it, excepting three which I myself saw in Briar Dene in 1905, just after they had arrived.

HEDGE-SPARROW (*Accentor modularis*).—Common. The local name is "Blueie," on account of the colour of its eggs.

DIPPER (*Cinclus aquaticus*).—An irregular visitor in autumn. Occasionally a bird is observed on the stream at Holywell.

LONG-TAILED TITMOUSE (*Acredula caudata*).—A rare migrant, arriving on the coast in autumn. The first record I can find is one which was found dead at Tynemouth in November, 1852, and was presented to J. Hancock by W. J. Forster, Esq. Hancock says of it:—"It was in a very good state of preservation, and, when picked up, could not have been dead more than a day or two. It had probably just arrived from the north of Europe." This bird was a specimen of the northern form of this species, the true *A. caudata*; that is, the White-headed Long-tailed Tit of some authors, owing to its having an entirely white head (Plate IV.). This is the only pure specimen of this form which has been obtained in England. It is figured in Hancock's Catalogue from a drawing by the author from the bird stuffed by him now in the Hancock Museum. (Howard Saunders, 'Man. British Birds,' p. 101.) Of the British form of the Long-tailed Tit (*A. rosea*), several examples have been obtained within the district. The first was shot by Mr. Ewen at St. Mary's Island on Nov. 11th, 1892, and is in his possession. It was stuffed by Mr. R. Duncan. The second was shot at Spittle Dene, near Tynemouth, in about 1890, by Mr. J. Douglas, now of Cullercoats; and another, a mature female, was shot in Holywell Dene, in about 1898, by Mr. Richardson, of Holywell. The figure is from the first-mentioned specimen in the Newcastle Museum.

GREAT TITMOUSE (*Parus major*).—A visitant by no means common.

MARSH-TIT (*P. palustris*).—A very rare visitor. I have only one record, which is of one shot at Holywell Dene in 1905.

BLUE TIT (*P. cæruleus*).—A fairly common resident, frequenting Holywell Dene chiefly.

WREN (*Troglodytes parvulus*).—A common resident.

TREE-CREEPER (*Certhia familiaris*).—A very rare visitor. The only occurrence was one shot in Holywell Dene in 1900 by Mr. Richardson.

WHITE WAGTAIL (*Motacilla alba*).—On Aug. 20th, 1854, Mr. Duncan shot a bird of this species near St. Mary's Island, which was identified at the time, and was obtained by a collector living in Shropshire. Mr. Duncan has a drawing of it in his possession, and it undoubtedly belongs to this species. Although this specimen was shot prior to the publication of Hancock's Catalogue, owing to an oversight it is not mentioned by him. Up to 1885 there had been no published record of its occurrence in Northumberland, in which year Howard Saunders observed one near Langley Castle ('Man. British Birds,' p. 123). This is, therefore, the first authentic occurrence of this species in Northumberland.

PIED WAGTAIL (*M. lugubris*).—Seldom seen in winter, but in spring it is more numerous, when birds that have spent the winter in the south return and pass inland to breed.

GREY WAGTAIL (*M. melanope*).—Only seen on the coast in winter, returning inland for the summer months. It is never numerous, and I have seldom seen more than three or four on the coast at the same time.

YELLOW WAGTAIL (*M. raii*).—A spring visitant, very uncommon. It never remains more than a day or two after its arrival in spring, but passes inland, up Briar Dene generally. From my notes, I see that the usual date of arrival is April 15th and the following week.

TREE-PIBIT (*Anthus trivialis*).—Only seen on migration, arriving in fair numbers during April. The earliest record I have is March 30th, which was in 1904.

MEADOW-PIBIT (*A. pratensis*).—Numerous; large numbers arrive in spring from further south. I once (March 30th, 1904) saw great numbers arrive at 7 a.m., and halt in the fields to rest. A local name for this bird is "Cheepy."

ROCK-PIBIT (*A. obscurus*).—A not uncommon partial migrant on the coast. The first record is of a male shot at Whitley in 1832 by John Hancock, which is now in the Hancock Museum.

(To be continued.)

SOME ODD NOTES ON YARMOUTH FISHES.

BY ARTHUR H. PATTERSON.

DURING the past thirty years the fishes of this district have afforded me much interest—in adding species hitherto unrecorded as local, and in noting the changes which have taken place as to numbers and movements. Some that were marked as rare on the Pagets' list ('Sketch of the Natural History of Yarmouth,' 1834) I have found to be exceedingly common, and others that were numerous in the earlier half of last century have become otherwise. I have been led to believe that most species are migratorial in habit—that some are fairly regular in coming and going, in their proper season, and that, like birds, which under certain conditions are spasmodic in their movements, many fishes fluctuate in numbers from year to year: they may be scarce one year, abundant another, or may come regularly for a time, and then absent themselves for long periods. What accounts for such capricious movements is not always discoverable, and it is certainly less easy to suggest reasons, as one may do sometimes in cases of bird fluctuations.

In our own immediate neighbourhood the Mackerel presents a striking instance. When I was a lad the Mackerel fishery was, and had been for years, an institution; May and June saw remunerative catches landed on the beach, the then market for their landing and dispersal. Then for years the spring fishery was practically a failure; and still later on they appeared in the autumn in company with the Herrings, so much so on occasion as to tempt owners to change the Herring-nets for the larger meshed Mackerel-nets. In recent years they have come again in some numbers in spring. No reason, so far as I can gather, is assigned for this, save mere caprice, which must certainly be a most unsatisfactory one; personally, I believe the movements of Herring-syle have to do with this phenomenon.

During the past fifty years considerable changes have taken place on Breydon; parts of it that, when I was a lad, were under water at low tide are now bare at half-ebb—indeed, for hours at a time the flats are dry: where the *Zostera* was flourishing, the mud is now hard, and those on the lowest level—bare of

"grass" then—are becoming solidified by a dense growth which will not be permanent. Over these flats, up till the seventies, Grey Mullet still largely fed in shoals, but in lessening numbers; they swarmed there in the earlier half of last century. Among the vegetation they found plenty of Crustacea and Mollusca, and varied their provender by partaking freely of the *Ulva lactuca*. Up till the same period Flounders were abundant, nets for these, as well as the Grey Mullet, being specially constructed and worked. Mullet were a payable catch, and Flounders were saleable as bait for Cromer fishermen. No one fishes especially for them to-day. The sewage pollution, which did not obtain until latter years, is undoubtedly detrimental in its effects; the sewage that runs freely into the rivers on the ebb-tide is not altogether got rid of ere the tide turns, and much of it goes upstream again.

For these reasons—pollution and the hardening of the flats—Eels have also become scarcer. Probably instinct has taught these various species to keep off the flats where they would be left stranded. The dainty Smelt, however, still persists in facing the altered waters, and, notwithstanding a reported scarcity in the Wash, local smelters complain more loudly on account of successive days of bad weather, which prevents them netting, than about a shortage of fish. These keep much to the three principal "drains" that are constantly widening and deepening, and also to the Channel. The numbers taken occasionally are astonishing, whilst good hauls are taken by the draw-netters in the Ham at Gorleston, and up the Bure.

I am of opinion that a much stronger current runs along the Yarmouth seaboard than when I first knew it, owing no doubt to the licking away of the sandhills farther north; these undoubtedly fended off the current. Much less seaweed and sea *débris* come ashore north of Yarmouth, and fish no doubt resort more to bay-like curvatures, as at the Ham, and again in the neighbourhood of Lowestoft, where great catches of Cods and Whittings are at times notorious; these come close inshore. That many fish "miss" our harbour that might otherwise ascend I have no doubt, since the lengthening of the North Pier and the deepening of the harbour-mouth automatically, as it were, combined with a stronger ebb-tide, all tend to keep them out and drive them southward.

The decay of the local trawling industry, and our dependence on Lowestoft vessels for even what little "offal" is used in our fish-shops, has led to a falling-off of many interesting species which, although not really local fish, albeit many of these boats trawl as near home as Cromer Knowle, at one time spiced one's interest by a sight of an occasional curiosity or sea-monster. A similar remark might apply to the Herring fishing, with its present-day rush and unrest—nothing that is unsaleable is bothered about, and so without a doubt many strange species are thrown back into the sea that in years gone by—in the leisurely old days—would have been brought ashore, to find one of the hands a small equivalent in tobacco, or the skipper a few shillings some showman might proffer him. Twenty years ago, when the fishing-luggers were mostly, if not all, sailing-boats—the Scotch boats, at any rate—the Scotch fishermen, thrifty and speculative, used to take to sea with them long hand-lines, for the purpose of catching Cods while the boats were lying to the net-warp drifting. Scores of excellent and large Codfish were brought by them to the fish-wharf, their sale making a nice little addition to the crews' earnings on occasion.

Since the deepening of the harbour-mouth and the constant dredging of the rivers have let up so much more water, the "salts" continually go higher up the rivers, and high tides are more frequent. One effect of this incursion of salt water may be seen in the deterioration of the common reed; localities that in my younger days were bright in summer-time with stretches of waving reeds are now bare of them. Old Breydoners have reminded me of reeds that grew halfway down beside Breydon north walls, and twenty years ago there grew a goodly patch near where my houseboat is moored. The Roach now never visit Breydon but by an accident of tide, whereas fifty years ago they were commonly caught there with Flounders in nets.

The Perch was in Lubbock's time still a regular visitor to St. Olave's. He writes: "St. Olave's bridge . . . has long been celebrated as a station for anglers; . . . if Shrimps are up as high as the bridge, it is generally found that Perch are there also." Sir Thomas Browne mentions their capture on Breydon "in mixed water." It was usual to take large Perch in the trammel-nets set for Flounders. I have not seen a Perch of any size taken at St. Olave's for a very long time; a few Roach and

occasionally a tolerable-sized Bream are taken on the neaps. The falling-off of large Perch in Norfolk waters has been noticed for some years; its decrease was laid at one time to the invasion of the *Anacharis* weed into its breeding haunts. Probably the unrest and turmoil of the waters caused by the great increase of steam, and now motor, vessels have had something to do with destroying the ova of this and other fishes, the swell from their screws beating the reeds with constant commotion: add to this the petrol which floats upon the surface.

The Bass, known locally as the "Sea-Perch," has become much less frequent in its visits, and is now seldom netted, notwithstanding considerable numbers appear to be found off Aldeburgh, and even up the Alde estuary.

The Bubalis, added to my Yarmouth list in 1891, and then believed to be rare, is not by any means so, numbers being taken in the shrimp-nets.

The Grey Gurnard inshores spasmodically. In a hot summer quite a host may put into the shallows, and even take the baits of anglers; then for years it is conspicuously absent. Last summer a home-coming fisherman saw, and reported to me, an unusual number in the roadstead; "the sea around the vessel," he assured me, "being alive with them."

The Lesser Weever is much more plentiful off Gorleston (where it runs to a large size) than on the Yarmouth side of the harbour. The quieter waters immediately south of the break-water apparently suit their habits.

The Scribbled Mackerel (said to be only a variety of the Common Mackerel) would seem to be met with annually. I generally manage to see three or four. It is curious to relate that this fish seldom or never occurs of a greater length than fifteen inches.

I have reason to believe that a migration of the John Dory takes place late in January and early in February, when they are about the size of one's hand. For some three weeks great numbers were taken in the neighbourhood of Cromer Knowle in the trawl-nets. Then followed them, during February, hordes of Greater Weevers, running to about ten inches in length.

The Scad, or Horse-Mackerel, generally occurs simultaneously with the Mackerel and Herring shoals, and are then of a goodly size—quite as large as the Mackerel themselves. Singularly

enough, although plentiful during the 1910 autumnal fishing, they invariably corresponded in size with the Herrings; this was much remarked on by fisher-folk. And now that cranning has superseded "telling" (counting) the Herrings, everything goes into the "swills" promiscuously, and the number of Scads discovered by the gutters when working at the troughs has given rise to much complaint, this fish being worthless, like the small Whittings and broken Herrings also measured in with the bulk.

The White Goby, which I added to the Norfolk list in 1890, when it was taken numerously, has ever since that year been seldom seen. It is stated by Günther to be a fish that is born, matures, and dies in one year.

The Pagets described the Skulpin or Dragonet—local, "Fox-fish"—as very rare; on the other hand, I find it on occasion abundantly taken by the local shrimpers.

There existed at one time a decidedly general prejudice against the ugly-headed Wolf-fish, locally known as "Cat-fish," as food. It was formerly brought into Yarmouth by the deep-sea trawlers, and seldom disposed of, except on the quiet, to fish-fryers, who sold it in savoury-smelling pieces after an experience in boiling fat. Latterly this species has been much in evidence at Norwich, Yarmouth, and elsewhere, filleted, smoked, and dyed to a bright yellow, and sold under the name of "Grimsby Haddock." Some persons profess to esteem this fish, but to me it eats very like coarse Skate.

The Viviparous Blenny does not nowadays seem nearly so plentiful as it did thirty years ago, when it was captured in some numbers in small trawls on Breydon and at the entrance of the rivers to cut up for bait for eel-lines, and as bait for the "pots," being covered with a very tough skin. It is exceedingly good eating, the flesh when fried being white and firm, and is as palatable as Sole; the backbone left on the plate is of a rich emerald-green colour.

In the October of 1890 immense shoals of small Codlings came up Breydon, and were taken on the hook as fast as the lines could be hauled out. One afternoon I filled the bottom of my boat with them. Since then only one or two such incursions have been noted there. I think it likely that they will not face the dirty river; maybe the piers set them off, for,

although great numbers may be taken at Lowestoft and off our piers, none seem to find their way to Breydon. Codlings were extremely numerous during the winter of 1910-11, fine examples being numerous taken outside the five-fathom limit.

In looking over the 'Guide to the International Fisheries Exhibition' (1883), I came across the following note:—"Many people will be surprised to hear that hardly more than thirty years ago, when trawling used to be systematically carried on in the North Sea, Haddocks were caught in such vast numbers that there was hardly any market for them, and the fishermen were ordered to bring only a certain number ashore. Tons of them were then thrown overboard again." The species in the southern part of the North Sea is now no longer common; off our own coast it is even of rare occurrence, and the capture of a small specimen on an angler's line is an event to be chronicled. I have noticed of late many Codlings smoked to pass muster with the Haddocks, and sold as such to the unwary; few, however, notice any perceptible difference in flavour.

The Whiting still comes late each autumn inshore in smaller or greater numbers, but seems to give the deeper waters off Lowestoft a greater preference than Yarmouth. The five-fathom limit is much closer inshore at Lowestoft. When Codlings are exceptionally numerous, Whittings are noticeably scarce.

Young Pollack the size of Mackerel, known at Yarmouth as "Pinnikin Coles," are irregular visitants. Occasionally in May they are numerous, even in the river. This fish occurred abundantly in the September of 1910. Adult examples are more commonly taken, I believe, off Wells.

Brill and Turbot of any size are not often met with in local waters; chance-time the wolders, fishing off Palling and beyond, and shrimpers take a few small Brill. The same may be said with regard to Plaice. Curiously enough, an occasional small Plaice strays up-river, one being taken on a hook near the entrance of one of the Broads a few months since, and was identified by a well-known local fish-merchant.

Whilst Flounders are not nearly so numerous on Breydon to-day, either in summer or winter, when large spawning examples used to congregate at the confluence of the Yare, Bure, and Breydon, considerable quantities of large fish draw

into the harbour during the Herring-fishing, and are caught in hoop-nets baited with broken Herrings. Numerous Eels are taken at the same time in the same fashion.

Several pairs of fine Soles are frequently taken in a day by those shrimpers who use small trawls in addition to their dredge-nets. I believe that large spawning Soles come numerous inshore near Palling in April; that process is soon over, and the spent fish at once betake themselves to deeper waters. I know one shrimper who appears to know where to drop across Soles, and who frequently in the summer displays several pairs in his little shop-window.

In my earlier rambling days it was not a rare thing to find variously sized Congers helplessly cast ashore during severe easterly frosts. I have seen old men carrying a sack for any such that they might find. The reason for their inshoring was due to their getting into shoal waters, and being nipped by frost, when their bladders, distending, placed them helplessly at the mercy of the breakers. It is a very rare circumstance nowadays to meet with the species off Yarmouth.

The various Sharks that get entangled in the nets when pursuing the Herring are now seldom brought ashore, there being no sale at all for them. At one time a few shillings might be made of them for some purpose or another. The Porbeagle, large Topes, and Nursehounds, at one time, were not infrequently landed; to-day they would only be thrown upon the refuse-heap, and, being useless, would be an inconvenience in these days of feverish bustle and haste. Piked or Common Dogs are washed ashore with dead Herrings when an easterly wind obtains. Spotted Dog-fishes would seem to have greatly decreased since the Pagets' time, when they were stated to be our commonest species.

The Lamprey and the River Lampern are in no request locally, and, although not rarely taken in the rivers, are seldom eaten. The Lampern, or Silver Lamprey, is by far the commoner species, and ascends our rivers for purposes of spawning. Mr. W. S. Everett assured me last year that "some thirty years ago a man named Bessey took from his eel-set in the Waveney, after one night's fishing, no less than 5 cwt. of Lampreys. He despatched them in boxes to London."

NATURAL HISTORY RECORD BUREAU (1910): THE MUSEUM, CARLISLE.

By D. LOSH THORPE & LINNÆUS E. HOPE, Keepers of the Records.

THE year 1910, though not altogether unproductive of ornithological incident, has perhaps been less so than most seasons, at least as regards rare occurrences on the Solway, or in Cumberland generally.

This was no doubt greatly owing to the mildness of the spring months, there being little or no frost or snow after the end of January in this district, and the absence of storm during the period of migration, which apparently pursued its normal course without any noticeable break.

The mild weather conditions during this season had also the effect of producing early nuptial arrangements amongst our resident birds, Thrushes were singing in January, Chaffinches in February, and Lapwings were investigating suitable nesting quarters high up on the moors by the end of February. Mr. Eric B. Dunlop, who has exceptional opportunities, and uses them, of observing the birds in his district, gives some early instances, and his notes on the birds in the Windermere district give a very good idea of the sequence of arrival of our summer visitors in the Lake District. On several dates in the spring of 1910 he heard and recorded the singing of the Redwing (*Turdus iliacus*); it is not the good fortune of every English ornithologist to hear the low plaintive song of this species of migratory Thrush in this country.

A considerable amount of controversy in the Press was occasioned by the extraordinary behaviour of a Common Buzzard (*Buteo vulgaris*), which has contracted the somewhat offensive habit of swooping at persons who trespass on the hillside which it considers its special domain. Let it be clearly understood that it is a single bird which has contracted this habit; the bird

is well-known to several Westmorland and Cumberland ornithologists, and this habit is not characteristic of the species. This bird has been variously described as a "Buzzard," "Bustard," and "Golden Eagle," but the reports of it attacking people are somewhat exaggerated, although it is a little disconcerting to have a large bird like a Buzzard swoop down near enough to knock off one's hat. It frequently swoops at and "strikes" sheep on the hillside when annoyed by the presence of man. We saw it do this when irritated.

Mr. W. Nichol, of Skinburness, Silloth, relates an instance of the persistence with which a Stoat will attack and pursue so large a bird as a Pheasant. On November 3rd he noticed a Pheasant running, followed closely by a Stoat; the Stoat tried to take the bird in the rear, but the Pheasant showed a bold front and kept his assailant at bay. After some time a Blackbird, which had been a spectator of the whole proceeding, attracted the Stoat's attention for a moment, when the Pheasant made off and hid in a clump of grass, but the Stoat, not yet defeated, again gave chase, and its tactics in again reaching his desired prey were most interesting; sitting up on its haunches, it spied out the ground frequently, but finally detected its quarry by scent, and after another tussle gave up in disgust and left the Pheasant master of the situation.

Mr. Nichol also contributed an interesting note on a Peregrine which frequented the shores of the Solway, near Silloth. On December 27th he noticed the Falcon chasing a Curlew which three times took to the water to escape its pursuer; the Falcon did not attempt to lift its prey from the surface, as it is said to do in the case of ducks which it has chased until exhausted, but finally left it on the water. Shortly after this incident the Falcon brought down a Barnacle Goose which Mr. Nichol had wounded by a shot.

The most interesting ornithological event of the year is one which is close home to us in connection with the wild Whooper Swan which has visited the Eden for six successive winters. Last year, as we recorded in these notes, the Whooper returned to the Eden on December 24th, accompanied by a mate and two other Swans of the same species, adult birds. On Nov. 16th she again returned, this time also accompanied by her mate,

but also by one young bird, evidently her offspring, and by two adult birds, presumably the two birds which spent last winter on the Eden, the latter being accompanied by two young birds, apparently their offspring. These seven Swans did not stay over-night on the river, and six of them *only* returned the following day, one of the adults of the pair with the two young being missing—evidently some accident to which wild birds are too frequently subject had overtaken one of the parents—and the two young Swans have continued to be attended by one adult only, the surviving parent. Two days later two more adult Whoopers made their appearance, perhaps the remainder of the herd to which our bird had become attached. These eight wild Swans have remained on the river during the whole winter, and at the time of writing are still with us.

The Puffin (*Fratercula arctica*), although a breeding bird all round our coasts, and especially numerous on some parts of the west coast, is not a common visitor to the Solway. Still it occasionally occurs, generally as a derelict on the shore, but sometimes as an exhausted bird picked up inland. We have twice known it picked up alive in the Solway district, the last being one in the early months of 1910, which was placed in our aviary, where it lived for several months. It at first evinced little desire for food, and refused all the dainties set before it in the shape of live and dead fish, &c., but after having had two or three mealworms placed in its mouth, it developed an appetite for those grubs which eventually became of alarming dimensions. It later began to take other food, live minnows and portions of fresh fish, but not if there was a mealworm about. He was in full nuptial or summer dress when obtained, with the curious wrinkled, orange-coloured skin around his eyes and at the corners of his mouth; his beak had the large horny casing with its orange and blue coloration which reminds one of an abnormally developed parrot's beak. This horny covering is part of the summer dress and is cast off in the autumn. This particular bird began casting his horny casing on August 19th.

It was a peculiar and interesting pet, becoming quite tame and taking mealworms and fish from the hand; but although a small pond in the aviary was stocked with minnows for his especial benefit, Billy, as he was called, could not be induced to.

fish for himself; in fact, we think that it was only in hope of getting a mealworm that he condescended to accept the fish from our hand. It is extraordinary what a fondness birds have for this grub, which is the larva of a beetle. Another bird we have in this aviary, and which likes the mealworm diet, is a Great Spotted Woodpecker (*Dendrocopus major*). It was also for some time extremely tame, and would fly on to one's shoulder or breast to be fed on its favourite diet of mealworms. We have had several other interesting birds in our aviary during the past year, including the Bearded Reedling or Bearded Tit, one of the most beautiful of British small birds; also the Bohemian Waxwing, a most docile bird in confinement, with its sleek silky plumage and red waxen appendages to the ends of the secondary wing feathers. We also had a Redstart which lived over winter, but unfortunately died in an early effort to moult.

During the last year or two numerous letters have been written to us recording rare plants found in the district, also animals other than vertebrates. When the "Record Bureau" at the Carlisle Museum was initiated, it was proposed to deal only with the vertebrate animals of the district—Cumberland and Westmorland and a radius of fifty miles around Carlisle—but we wish to state now that if those persons who are students of any branch of Natural History, including the lower animals (Invertebrata) of all or any orders, botany, palæontology, or mineralogy, care to correspond with us upon such matters, we will be pleased to place on record, in the same way in which we treat the vertebrate animals, all records of invertebrate animals, plants, fossils, or minerals.

Mr. J. C. Varty Smith, of Penrith, writes that in June, 1908, he found examples of a rare aquatic plant, *Ranunculus circinatus*, in Thacka Beck, Penrith, previous records of this plant in Cumberland being doubtful.

Messrs. Chas. Platt and David Dickenson both record the rare orchis *Goodyera repens*, respectively, from Great Corby and Armathwaite in July, 1910.

The following are the vertebrate notes and records sent in to the Bureau during 1910:—

January 4th.—Song-Thrush singing at Troutbeck, Windermere (Eric B. Dunlop).

5th.—Redwings singing at Troutbeck, Windermere (Eric B. Dunlop).

6th.—Mistle-Thrush singing at Troutbeck, Windermere (Eric B. Dunlop).

29th.—Grey Lag-Geese (fourteen) seen near Silloth; Peregrine Falcon frequenting shore at Skinburness (W. Nichol).

31st.—Wild Geese (unidentified) and Red-throated Divers (three) seen near Silloth (W. Nichol).

February 1st.—Chaffinch singing at Troutbeck, Windermere (Eric B. Dunlop).

2nd.—Song-Thrushes singing at Stanwix (Linnæus E. Hope).

9th.—Barn-Owl hawking in daylight in Carlisle (T. L. Johnston).

10th.—Tawny Owl hooting at Stanwix Bank (Linnæus E. Hope).

12th.—Chaffinch singing at Carlisle (H. Marks).

14th.—Sky-Lark singing near Stanwix (Linnæus E. Hope).

17th.—Grey Lag-Geese (seventeen) seen near Silloth (W. Nichol).

22nd.—Blackbird first heard singing at Troutbeck (Eric B. Dunlop).

25th.—Curlews passing over Stanwix during day and returning to Solway at evening (Linnæus E. Hope).

26th.—Lapwings first seen on the moors, Windermere (Eric B. Dunlop).

27th.—Curlews passing inland near Windermere (Eric B. Dunlop).

March 4th.—Wild Geese, three separate parties of twenty-five, thirty, and sixty seen near Silloth (species unidentified) (W. Nichol).

6th.—Corn-Buntings commenced singing near Carlisle (T. L. Johnston).

9th.—Redwings heard singing at Troutbeck, Windermere (Eric B. Dunlop).

13th.—Hawfinches (two) seen at Crosby-on-Eden (E. Hodgson). Sand-Martins (two) seen at Crosby-on-Eden by four independent observers (J. B. Cairns). Dipper's nest with one egg at Westward, Wigton (R. W. Barwise).

17th.—Corn-Buntings (flock of sixty-two) on wires at Todhills (J. B. Cairns).

21st. — Rooks begin to stay overnight at rookeries near Carlisle (T. L. Johnston). Brent Geese (eleven) seen near Silloth (W. Nichol).

22nd.—Redwings heard singing at Troutbeck, Windermere (Eric B. Dunlop).

26th.—Wheatear first seen near Silloth (W. Nichol).

28th.—Wheatear seen at Silloth (D. Losh Thorpe).

31st.—Wheatear first seen at Windermere; a Raven's nest contained young (Eric B. Dunlop).

April 2nd.—Two of the four Whooper Swans which have spent the winter on the River Eden left to-day. They appeared restless and greatly excited all day before leaving (D. Losh Thorpe).

7th.—Barnacle Geese (flock) seen near Silloth (W. Nichol).

10th. — Knots in aviary showing signs of summer dress (D. Losh Thorpe).

14th.—Swallow first seen near Windermere (Eric B. Dunlop).

15th. — Wheatears first seen at Carlisle Cemetery (J. T. Charlton). Swallow first seen near Silloth (W. Nichol).

16th. — The two remaining Whooper Swans, one of which was our regular visitor, missing at intervals of a day or two since the other two went northwards, finally left on this date (L. E. Hope and D. Losh Thorpe). Ring-Ouzel first seen near Windermere (Eric B. Dunlop). Grey Lag-Geese (sixteen) seen near Silloth, Solway (W. Nichol).

17th.—Willow-Warbler and Swallow seen near Carlisle (T. L. Johnston). Willow-Warbler seen at Westward, Wigton (R. W. Barwise).

18th. — Swallow first seen at Carlisle Cemetery (J. T. Charlton).

19th.—Redshanks visiting flood-water at Crosby-on-Eden (E. Hodgson). Swallows arrived at Westward, Wigton (R. W. Barwise). Goldcrests (one pair) nesting in Cemetery Grounds, Carlisle (J. T. Charlton).

20th.—Swallow first seen at Toddell, Cockermouth (W. F. Dixon). Willow-Warblers first seen at Windermere (Eric B. Dunlop).

21st.—Sand-Martin first seen near Windermere (Eric B. Dunlop).

22nd.—Wild Geese very numerous on Rockliffe Marsh (G. F. Saul).

24th.—Redstart first seen near Windermere (Eric B. Dunlop).

26th.—Richardson's Skua (adult) seen near Silloth (W. Nichol).

28th.—Cuckoos (three) seen at Todhills, Carlisle (J. B. Cairns).

29th.—Corn-Crake first heard at Westward, Wigton (R. W. Barwise). Yellow Wagtail first seen near Windermere (Eric B. Dunlop).

30th.—Cuckoo first heard at Westward, Wigton (R. W. Barwise). Cuckoo first heard near Silloth; Shoveler Ducks (two) seen on Solway (W. Nichol).

May 1st.—Corn-Crake heard at Harker, Carlisle (J. B. Cairns).

2nd.—Cuckoo first heard at Troutbeck, Windermere (Eric B. Dunlop). Lesser Terns arrived on Solway; White Wagtails (three) seen near Silloth (W. Nichol).

4th.—Grasshopper-Warbler heard near Carlisle (T. L. Johnston). Swift seen at Etterby Scaur, Carlisle (D. Losh Thorpe). Grasshopper-Warbler heard at Todhills Moss (J. B. Cairns). Swifts (two) seen at Gretna (J. B. Cairns).

5th.—Wood-Warbler first heard at Troutbeck, Windermere (Eric B. Dunlop).

8th.—Spotted Flycatcher first seen at Troutbeck, Windermere (Eric B. Dunlop).

16th.—Sedge-Warbler singing at Etterby Scaur (D. Losh Thorpe).

19th.—Whimbrel (six) seen near Silloth (W. Nichol).

21st.—Knots (two) and Bar-tailed Godwits (three) seen on Solway (T. L. Johnston). Dotterel seen in Lake District (G. F. Saul).

28th.—Sanderlings (flock of over two thousand) on shore at Silloth (W. Nichol).

June 1st.—Black-headed Gull nesting (one nest) at Bassen-thwaite (W. J. Farrer).

8th.—Sanderlings extremely numerous and very tame; over three thousand on the shore near Silloth (W. Nichol).

28th.—Oystercatchers (pair) on the Eden above Crosby (E. Hodgson).

July 4th.—Hawfinch and young seen at Crosby-on-Eden (E. Hodgson).

5th.—Cuckoo heard (last time) near Windermere (Eric B. Dunlop).

22nd.—Manx Shearwaters (twelve) seen on Solway (J. W. Armstrong).

30th.—Cormorants (three) flying up Windermere (Eric B. Dunlop). Turnstone in summer dress seen near Silloth (T. L. Johnston). Knots and Bar-tailed Godwits (three hundred to five hundred of each species) on Solway; mostly in summer dress (W. Nichol).

August 1st.—Greenshanks (two) seen on Newton Marsh, Solway (T. L. Johnston).

4th.—Crossbills (several) seen at Troutbeck, Windermere (Eric B. Dunlop).

5th.—Greenshanks (two) seen near Silloth (W. Nichol).

6th.—Skua seen near Silloth (W. Nichol).

12th.—Greenshank, Spotted Redshank, Little Stint seen near Silloth (W. Nichol).

22nd.—Mistle-Thrush heard singing near Windermere (Eric B. Dunlop).

September 1st.—Greenshanks (eleven) seen on Newton Marsh, Solway (T. L. Johnston). Green Sandpiper seen on Newton Marsh, Solway (T. L. Johnston). Wigeon (eight) and Shovelers (three) seen on Solway (T. L. Johnston).

10th.—Swift seen at Etterby Scaur (late date) (D. Losh Thorpe).

12th.—Wood-Warbler uttering a few notes near Windermere (Eric B. Dunlop).

17th.—Black Tern (immature) seen on Solway (T. L. Johnston).

19th.—Wild Geese arrived on Burgh Marsh (T. L. Johnston). Barnacle Geese arrived on Newton Marsh (T. L. Johnston). Barnacle Geese near Silloth (W. Nichol).

October 1st.—Song-Thrush singing at Troutbeck, Windermere (Eric B. Dunlop).

4th.—Swallow seen at Silloth (D. Losh Thorpe).

5th.—Swallow seen at Wigton (W. H. Redmayne). Peregrine Falcon frequenting Solway, near Silloth (W. Nichol).

6th.—Peregrines (two) seen near Silloth (W. Nichol).

8th.—Shovelers (three) seen near Silloth (W. Nichol). Swallow last seen at Troutbeck, Windermere (Eric B. Dunlop).

9th.—Wild Geese (one hundred and fifty) flying south-east over Carlisle (D. Losh Thorpe).

11th.—Redwings first seen this season near Windermere (Eric B. Dunlop). Fork-tailed Petrel seen near Sillioth (W. Nichol).

18th.—Peregrine Falcon, Red-throated Diver, Red-breasted Mergansers (two) seen on Solway, near Sillioth (W. Nichol).

20th.—Fieldfares first seen at Troutbeck, Windermere (Eric B. Dunlop).

22nd.—Bramblings first seen at Troutbeck, Windermere (Eric B. Dunlop).

November 2nd.—Goosander seen on Windermere Reservoir (Eric B. Dunlop). Manx Shearwaters (two) seen on Solway (J. W. Armstrong).

3rd.—Pheasant attacked by Stoat (note in introduction) (W. Nichol).

4th.—Bewick's Swans heard passing down Solway at night (W. Nichol).

9th.—Great Crested Grebe (immature) shot at Anthorn (T. L. Johnston).

14th.—Wigeon (about four hundred) on Solway (W. Nichol).

15th.—Mallards very numerous on Solway (W. Nichol).

16th.—Whooper Swans (seven) arrived on the River Eden, Carlisle (T. Hudson).

18th.—Wild Swans (seven) seen on Solway (W. Rutherford). Whooper Swans (two more adults) arrived on Eden (T. Hudson).

28th.—Red-breasted Mergansers (three), Red-throated Divers (three), seen on Solway, near Sillioth (W. Nichol).

December 13th.—Bohemian Waxwing shot at Glasson, Burghby-Sands (Jas. Bryson).

15th.—Grey Lag-Geese (twelve) seen at Skinburness, Sillioth (W. Nichol).

24th.—Hawfinch seen at Crosby-on-Eden (E. Hodgson).

27th.—Peregrine Falcon attacking Curlew and Barnacle Goose (noted in introduction) (W. Nichol).

28th.—Little Stint seen at Skinburness, Sillioth (W. Nichol).

30th.—Grey Lag-Geese (fourteen) seen at Skinburness, Sillioth; pack of Bewick's Swans heard in flight down Solway (W. Nichol).

NOTES AND QUERIES.

AVES.

On the Interbreeding of the Song-Thrush and Blackbird in Middlesex.—I think that most naturalists will hesitate to accept the conclusions which Mr. Adamson seems to me too readily to draw from what he has seen with regard to these two species in Middlesex (*ante*, p. 194). In the first place, with regard to the Thrush's nest found on March 30th containing three eggs resembling those of the Redwing; I would suggest that the probable explanation is that a hen Blackbird had laid her eggs in a Thrush's nest. It is not an uncommon thing for a wild bird to appropriate the nest belonging to another species, but I think that naturalists will expect much clearer proof than Mr. Adamson furnishes before they can agree with his conclusion that in certain districts Blackbirds and Thrushes freely interbreed. Then as to Mr. Adamson's assertion that he has always found that the male bird has the influence over the external appearance of the shell of the egg—may I ask him for a clear proof of this assertion? Judging from the fact that domestic hens of a breed which lay pure white eggs when mated with cocks of a brown egg-laying breed still continue to lay pure white eggs, and that white egg-laying ducks when mated to a drake of a green egg-laying breed still continue to lay white eggs, I should have supposed that a hen Thrush when mated to a Blackbird cock would lay an egg precisely similar to an ordinary Thrush's egg; in other words, that the male bird would have no influence over the external appearance of the shell of the egg. Mr. Adamson further says: "In nine cases out of ten the eggs are unfertile, and are never incubated by the female." I would ask him how he ascertains that the eggs are unfertile except by their being incubated, and also, whether he believes that an egg which had not been fertilised would be influenced by the male bird in the external appearance of the shell?—E. W. H. BLAGG (Cheadle, Staffordshire).

Hedge-Sparrow's Nest inside a Blackbird's Nest.—When staying at Aston-le-Walls, Northamptonshire, in April, I found the nest of a Hedge-Sparrow built inside an old Blackbird's nest in a yew hedge. Two eggs were laid, but disappeared. The Hedge-Sparrows, relying

on the walls of the Blackbird's nest, had not put nearly so much material as usual into their own nest—merely lining on one side.—W. G. N. APLIN (Bloxham, Oxon).

Pied Flycatcher in Warwickshire.—On May 6th last a friend and myself observed a Pied Flycatcher near here. Whether this species has been recorded for Warwickshire or not, I am unable to ascertain *definitely*, although it has probably been observed, as I understand is the case with neighbouring counties. As it is necessarily of rare occurrence, I thought it worthy of record.—BERNARD STARLEY (46, Holyhead Road, Coventry).

Pied Flycatcher in Northamptonshire.—A male Pied Flycatcher, which I examined while it was still in the flesh, was shot at Aynho about May 4th. I have only known of one previous occurrence of this species in that part of Northamptonshire, and Lord Lilford only mentions some half-dozen more instances in other parts of the county.—O. V. APLIN (Bloxham, Oxon).

The Mobbing of Cuckoos and Hawks.—*Apropos* of the remark made by Mr. Edmund Selous (*ante*, p. 183) that the Cuckoo is more frequently followed by small birds than the Sparrow-Hawk, I would add that in Ireland, where I have frequently seen the Cuckoo attacked and driven from place to place by small birds, the small birds that I have seen so engaged have almost invariably been of one species, the Meadow-Pipit. In other words, the only species of bird that in Ireland is commonly victimised or duped by the Cuckoo, and has frequently to rear the latter's young, is also the only bird that is much addicted to mobbing it. For this reason I have long been satisfied that the Cuckoo is mobbed in this country simply and solely because it is recognized as a Cuckoo, and that its superficial resemblance to a Hawk has nothing whatever to do with the matter. Judging from descriptions, it seems to be far more generally mobbed in England; but then it would also appear that English Cuckoos are far more indiscriminate in their choice of foster-mothers. I must add that I have also frequently seen the Sparrow-Hawk mobbed, but never by Meadow-Pipits; and the aggressors have, as a rule, the good sense to confine their attacks to occasions when the Hawk is encumbered with booty, and so cannot retaliate. Their observance of this sort of discretion leaves, I venture to think, no room for the theory that they give chase to the Cuckoo at first sight through mistaking it for a Hawk.—C. B. MOFFAT (36, Hardwick Street, Dublin).

Osprey in Renfrewshire.—On May 19th last I found an Osprey (*Pandion haliaëtus*) lying dead on a grass-ledge in a glen in the north-west corner of Renfrewshire. It was a male bird in fine plumage, but had been dead some time, and the head was destroyed. The skin has been preserved as far as possible. The dimensions are—Length $22\frac{1}{2}$ in.; wing-spread 5 ft. 5 in.; closed wing 20 in.; beak $1\frac{5}{8}$ in.; base of beak to base of tail $13\frac{1}{4}$ in.; tail $9\frac{1}{2}$ in.; tarsus $2\frac{3}{4}$ in.—THOMAS MALLOCH (Mount Pleasant, Johnstone, Renfrewshire).

The Honey-Buzzard.—I am grateful to Mr. Jourdain for his comments on this subject (*ante*, p. 149), and regret that so well-informed an authority cannot add any definite records of eggs or young birds to my scanty list. To some of the records of "breeding" which he mentions, I referred in my former note, and others did not furnish the particulars I required, or were unsatisfactory. But I am now able to add Durham to my list. Mr. Isaac Clark has kindly given me particulars of a nest built in some beech-woods on the banks of the River Derwent, which contained two young birds early in August, 1899. I have to thank Mr. Noble for telling me of this nest in the first instance.—O. V. APLIN (Bloxham, Oxon).

Decrease of Corn-Crake, Nuthatch, and Wryneck.—The scarcity of the Nuthatch noticed here (*ante*, p. 114) extended as far north as the southern part of Warwickshire, where the bird used to be very common and has been scarce of late years. But I hear that the tide seems to have turned, and a few birds have been noticed again lately. Here, too, it may have turned. There are one if not two pairs about the village this summer. A pair still (May) comes for nuts, but have scorned a Berlepsch nesting-box I put up just over the nut-board, and Blue Tits took it. The Nuthatch has many admirers outside the ranks of professed ornithologists, and it is easy to get some idea of its status. All round here the tale has been the same for some years. As to north-west Oxon and Oxford, *cf.* Mr. Fowler's note, "Where are our Nuthatches?" ('Zoologist,' 1909, p. 155). With regard to the *increase* of this bird with Mr. Noble, may it not be possible that this is partly, at all events, owing to the ample provision of nesting-boxes? Birds like the Nuthatch (and the Wryneck, too) must have suffered a good deal, not only from usurpation of nesting-holes by the increased Starlings but also by the destruction and removal of old "useless" trees, often full of old Woodpeckers' and other holes. The old trees have been disappearing steadily and surely; and as the birds named cannot make holes for themselves, and will not put up with tin-pots and kettles as readily as Tits do,

the housing question has been (too literally) a burning one with them for some time past. I have often been urged to sweep away about a dozen old pollard ash trees—partly hollow and with many holes in them—on the ground that they are useless, “only suck the ground,” and would make a lot of firewood. I always feel that obstinate silence on the subject is better understood than the only reason I could give for leaving them standing! Whatever the real cause or causes of the present scarcity of the Corn-Crake in parts of England may be, I do not think the use of mowing-machines is one. The mowing-machine was in use many years before the scarcity of the birds was noticed. Corn-Crakes were common down to 1885, after which the falling-off was more or less sudden, not gradual. And I should think that nests were more likely to be mown out in the days of the scythe, when mowing generally began earlier. I do not remember hearing much of old Corn-Crakes being killed here either by the scythe or the machine, and should think the rattle of the latter would be more likely to warn the bird to leave her nest than the gentle swish of the scythe. But I do think that telegraph-wires may have had a good deal to do with the decrease, by the destruction of the old birds on their arrival in the spring. For no birds suffer more in this way than the Crake family. I attribute to the wires also the greater scarcity nowadays of the Spotted Crake, which I have often known killed by the wires in years gone by. I do not think protection by law would have the least effect—here at all events. I never once remember hearing of a Corn Crake's nest being found here unless it had been mown out; and when mown out no further harm could result from taking the eggs. It would be far better to take them than to leave them for the Rooks to eat, and so encourage the latter in the very bad habit they have got into of searching every field as soon as the grass or clover is down for nests and eggs. Then, as to shooting the birds in the autumn, I can only say that we have as many of these passing migrants as ever. They evidently hail from some distant locality where the bird still breeds in numbers, and shooting them has no effect whatever on the breeding stock in this part of the country. The idea that protection is a remedy in *all* cases for the present-day scarcity or the growing scarcity of a bird has been overdone, and is, I hope, an exploded notion. Protection has not saved the Stork in Holland. Take the case of Ray's Wagtail. I took a long walk in the Cherwell Valley one day in May, and I saw one of these birds. Some years ago I should have seen—I feel sure—a dozen pairs, perhaps more. The

bird has been scarce for years. Yet I do not suppose anyone would contend that it has suffered in the least from human persecution, direct or indirect, or that any amount of protection and County Council orders would have any effect on its future status.—O. V. APLIN (Bloxham, Oxon).

Breeding of the Honey-Buzzard in England.—In reply to Mr. Heatley Noble's note under the above heading (*ante*, p. 200), I should like to say that my reference to Burnham Beeches, "Berks," is a quotation from the 'Ibis' for 1865, p. 13. Cf. Charlesworth's 'Magazine of Natural History,' p. 539.—F. C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

AMPHIBIA.

Palmate Newt in Shropshire.—In May last I had brought to me several Newts out of about thirty taken by some children from a pond at Church Stretton. All those which I saw were *Molge palmata* in full breeding dress. This is quite a new locality for the species, which has previously been recorded in Shropshire only from the Forest of Wyre, where it was first discovered by Mr. J. Steele Elliott. A dried-up specimen sent to me from Shifnal some ten years ago was, I believe, of this species, but it was so withered that I could not be certain of its identity.—H. E. FORREST (Shrewsbury).

OBITUARY.

ROBERT SERVICE.

MR. ROBERT SERVICE died at his residence in Maxwelltown, Dumfriesshire, on May 8th, at the age of fifty-six. He had for some time been in poor health, mainly owing to worries connected with his business of nurseryman and seedsman. He was an accomplished naturalist and a keen observer, with a thorough knowledge of the birds, beasts, fishes, and insects of the South of Scotland, and of their haunts and habits.

Much that he knew is lost with him, but many of his original observations are recorded in the notes and papers which he contributed to 'The Zoologist,' the 'Annals of Scottish Natural History,' and the 'Transactions' of the Natural History Societies of Dumfriesshire and Galloway, Glasgow, and Edinburgh. He was the author of

a chapter on the Natural History of Kirkcudbrightshire in Maxwell's 'Guide Book to the Stewartry of Kirkcudbright.' Of his memoirs on Mammals, special mention may be made of one entitled "The Old Fur Market of Dumfries," written in 1891, and containing much of interest about the skin trade, the causes of its decline, and the animals that supplied the staple; and of another, "Mammalia of Solway" (1896), in the form of an annotated list. The Solway Area includes Lochs Grannoch and Dungeon, which hold Char, Loch Ken, famous for its large Pike, and Lochmaben, the home of the Vendace. A good deal about these interesting fishes is to be found in Mr. Service's paper, "The Freshwater Fishes of the Solway Area" (1892). He considered the disputes and claims arising out of the Salmon fisheries to be a public scandal, unsatisfactory to everybody except the lawyers, and wrote:—"The late Frank Buckland would have found a very large number of people here to agree with him, if in his famous statement that more lies have been told about the Pike than about any other fish in the world he had substituted 'Salmon' for 'Pike.'"

Mr. Service took a great interest in the production of Mr. H. S. Gladstone's recently issued book on 'The Birds of Dumfriesshire,' and his co-operation is thus acknowledged by the author in the preface:—"With so many willing assistants it becomes almost invidious to mention any by name; it is, however, quite certain that pre-eminent among them stands Mr. Robert Service. The frequent mention of his name throughout the volume testifies to my obligation to him, and he has, moreover, helped in the revision of the book in all its various stages."

We have endeavoured to indicate above the wide range of Mr. Service's knowledge, and the varied nature of his attainments. In glancing through his published memoirs and notes one is especially struck by the fact that whatever subject he was writing on—bird-migration, insect-life, colour variation, the Vole plague, new, rare, or extinct animals, &c.—he always had something to say that was well worth saying, and knew how to leave out that which was trivial and unimportant. He was generous with his knowledge, and many knew him as a valued correspondent, who took a delight in giving information.

C. T. R.

